

## WRITTEN REPLY

To: The Examiner of the Japanese Patent Office

1. International Application      PCT/JP2004/00516

2. Applicant

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4. Date of Notification      May 11, 2004

5. Content of Reply

(1) Claim 1 is amended as follows:

A masking member made of a modified polypropylene sheet in which 5 to 30% by weight of polyethylene and/or ethylene-propylene copolymer is mixed in with polypropylene, said masking member being manufactured by vacuum and/or pressure forming, said modified polypropylene into a prescribed shape.

In the invention of said amended Claim 1, a masking member having a complex shape is provided by vacuum and/or pressure forming, since said modified polypropylene sheet does not droop under its own weight, even when said sheet is heated at a temperature at which said sheet is moldable.

(2) Literature 1 (JP9-71754 A) discloses a masking tape made of an ethylene-propylene copolymer sheet, but said sheet lacks the hardness required to be molded by vacuum and/or pressure forming. Said masking tape of this Literature is an unmolded sheet.

(3) Literature 2 (JP9-272849 A) discloses a masking tape made of a polyolefine resin

film, but since polyolefine single film may be apt to droop under its own weight by heating at the temperature at which said film is moldable, molding with high accuracy may be difficult, as described in the section 'BACKGROUND OF THE INVENTION' in the specification of the present application.

(4) Literature 3 (JP11-276947 A) discloses polypropylene, polyethylene, ethylene-propylene copolymer, and the like, as the masking member materials, but does not disclose the use of the compound consisting of polypropylene and polyethylene and/or ethylene-propylene copolymer, so that the effect of the present invention is unforeseen, said effect being that a sheet of this compound, in which polyethylene and/or ethylene-propylene copolymer is mixed in with polypropylene does not droop under its own weight when said sheet is heated at a temperature at which polypropylene is moldable, and vacuum and/or pressure forming moldability is improved.

(5) Literature 4 (JP5-317767A) discloses a masking tape, or sheet for coating having a support made of a copolymer of olefine and unsaturated carboxylic acid or a copolymer of olefine and other vinyl monomer(s), or neutralized substances of said copolymers, but the compound of the present invention is not disclosed, and further, the vacuum and/or pressure forming of said sheet is not disclosed, so that said effect of the present invention is unforeseen from the disclosure in this Literature.

(6) Literature 5 (JP3026624 U) discloses a masking tape, having a backing layer made of polypropylene, polyethylene ethylenepropylene copolymer, and the like, but the compound of the present invention is not disclosed in this Literature, so that the effect of the present invention is unforeseen from this Literature.

(7) As described above, Literatures 1 to 5 do not disclose the compound of the present invention, so that the effect of the present invention is unforeseen from the disclosures in Literatures 1 to 5, and as a result, the present invention has an inventive step.

6. The list of attached document: Amendment

## AMENDMENT

(Amendment based on Article 11)

To : Examiner of the Patent Office

### 1. Identification of the International Application

PCT/JP2004/000516

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### 4. Item to be Amended

Specification and Claims

### 5. Subject Matter of Amendment

- (1) The expression "is mixed in with polypropylene." on page 2, line 2 should be amended as "is mixed in with polypropylene, said masking member being manufactured by vacuum and/or pressure forming, said modified polypropylene into a prescribed shape".
- (2) The words "Generally" and " in this case" on page 2, line 32 should be deleted.
- (3) The expression " aside from said method , pressure forming, press molding the blow forming, and injection molding also may be applied in the present invention" on page 6, lines 6 to 8 should be amended as " aside from said method, pressure forming also may be applied in the present invention".
- (4) The expression "a modified polypropylene, in which 5 to 30% by weight of polyethylene and/or ethylene-propylene copolymer is mixed in with polypropylene" in Claim 1 should be amended as "a modified polypropylene sheet in which 5 to 30 % by weight of polyethylene and/or ethylene-propylene

copolymer is mixed in with polypropylene, said masking member being manufactured by vacuum and/or pressure forming, said modified polypropylene into a prescribed shape”.

(5) Claim 3 should be deleted.

(6) The expression” A masking member in accordance with Claim 3, wherein a non-modified polypropylene film covers one or both sides of said modified polypropylene sheet” in Claim 4 should be amended as “A masking member in accordance with Claims 1 and 2, wherein a non-modified polypropylene film covers one or both sides of said modified polypropylene sheet”.

#### 7. List of Attached Documents

- (1) Replacement sheets of page 2, 2/1 and 6 of the specification
- (2) Replacement sheet of pages 16 of the claims.

member made of a modified polypropylene, in which 5 to 30% by weight of polyethylene and/or ethylene-propylene copolymer, is mixed in with polypropylene, said masking member being manufactured by vacuum and/or pressure forming, said modified polypropylene into a prescribed shape. It is desirable that 20 to 50% by weight of an inorganic filler also be mixed in with said modified polypropylene. Further, said masking member is preferably manufactured by vacuum and/or pressure forming said modified polypropylene sheet.

Additionally, it is desirable that a non-modified polypropylene film cover on one or both sides of said modified polypropylene sheet.

(Action)

Since polyethylene and/or ethylene-propylene copolymer is mixed in with said modified polypropylene as the material of the masking member of the present invention, said modified polypropylene sheet is heated at a temperature up to the point at which said modified polypropylene sheet does not droop under its own weight, and can be molded easily into a highly accurate masking member, having a complex shape.

Nevertheless, in a case where the amount of polyethylene and/or ethylene propylene copolymer mixed in is less than 5% by weight, the moldability of said polypropylene is insufficiently improved, making it difficult to mold a complex shape, and in a case where the amount of polyethylene and/or ethylene-propylene copolymer mixed in is beyond 30% by weight, said modified polypropylene has a poor hardness, meaning that its shape and dimensional stability, and heat resistance may degrade.

By adding an inorganic filler to said modified polypropylene, its mechanical strength improves and heat transfer coefficient rises, improving its heat resistance. Nevertheless, in a case where the amount of an inorganic filler mixed in is less than 20% by weight, an improvement in heat resistance is not remarkable, and in a case where the amount of an inorganic filler mixed in is beyond 50% by weight, said modified polypropylene sheet has poor elongation, resulting in poor moldability, and furthermore poor chemical resistance.

Said modified polypropylene is molded into a sheet, and said modified polypropylene sheet can easily be molded into a complex shape, and vacuum and/or pressure forming which is(are) suitably applied to mass production

can be employed.

In this case, when a non-modified polypropylene film cover one or both sides

of said agents may be mixed, and then added to said modified PP.

To manufacture said masking member using said modified PP, a method wherein said modified PP is molded by vacuum and/or pressure forming to be a molded film or sheet, having a prescribed shape, is the most suitable method for molding a deep drawing shape or complex shape, and for mass production, but, aside from said method, pressure forming also may be applied in the present invention.

A film or expanded film of thermoplastic resin, such as polyolefin such as PE, non-modified PP, EPR, ethylene-vinyl acetate copolymer, or the like, polyvinyl chloride group resin, acrylic resin, methacrylic resin, polyvinylidene chloride group resin, styrene group resin, vinyl propionate group resin, styrene-butadiene copolymer, polyester group resin, or the like, may be laminated onto said modified PP sheet on one side or both sides.

In view of interlaminar adhesion and heat resistance properties, a non-modified PP film is preferable. When a filler, particularly an inorganic filler, is added to, and mixed with modified PP, said film secures the sheet surface's smoothness, improving its chemical resistance. Usually a modified PP sheet's thickness is 300 to 600  $\mu$  m, and when a film is formed on the surface of a sheet, the thickness of said film is 10 ~100  $\mu$  m.

In order to enhance the affinity of the polymer alloy masking member surface with paint or adhesive, a surface treatment such as a corona discharge treatment, primer coating treatment, or the like, may be performed.

The primer used for the primer coating treatment is, for example, a synthetic resin type primer, such as modified polyolefin, or an olefin copolymer (e.g. chlorinated polypropylene, ethylene-vinylacetate copolymer), a synthetic rubber, such as styrene-butadiene rubber, acrylonitrile-butadiene rubber, chloroprene-rubber, polybutadiene, or the like; an acrylic synthetic resin, vinyl synthetic resin, an acrylic synthetic resin containing an amino group and/or amide group, a vinyl synthetic resin containing an amino group and/or amide group, an amino synthetic resin, epoxy resin or the like; and a low-molecular weight compound primer, such as aluminum alcoholate or an aluminum chelate agent, such as aluminum isopropylate, aluminum triacetylacetonate, or the like; an alkyl metal, such as 2-ethylhexyl lead, hexadecyl lithium or the like; an organotin compound, such as dibutyl tin diacetate, di-n-butyl tin dioxide, or the like; a silane compound, such as